

# **Small Scale Trace Contaminant Testing of SA9T at Ambient and Reduced Pressure Conditions**

Craig Broerman

*Hamilton Sundstrand/Engineering and Science Contract Group, Houston, Texas, 77058*

Jeff Sweterlitsch

*NASA Johnson Space Center, Houston, Texas, 77058*

A principle concern for air revitalization technology in a closed loop system is the capability to control carbon dioxide (CO<sub>2</sub>) and humidity (H<sub>2</sub>O). An amine based sorbent technology, SA9T, has long been evaluated for use in this application and several programs are evaluating it for use in both a cabin as well as space suit applications. While the CO<sub>2</sub> and H<sub>2</sub>O performance of the sorbent has been tested extensively, the question of how trace contaminants impact performance requires further evaluation.

This paper presents experimental results of small scale SA9T testing that was performed over a variety of test conditions and with a variety of trace contaminants. Testing evaluated the ability of SA9T media to sufficiently remove CO<sub>2</sub> and H<sub>2</sub>O after exposure to a fully saturated trace contaminant at ambient conditions. Testing also evaluated the impact of CO<sub>2</sub> and H<sub>2</sub>O removal performance at suit loop pressures during cyclic operation with a constant inlet contaminant load. In addition, testing evaluated the performance of SA9T at ambient conditions in a continuous 30-day test with a mixed trace contaminant stream.